23: Franck--343 [2] T-2 (1924) 1926 Laotians
116, 243, 252, 415

"They hull their rice as it is needed, by stepping on the end of a long pole ending in a big wooden pestle, which falls monotonously into a wooden mortar, a hollowed section of large tree-trunk. These seem to be the chief occupations, but there are many others, as the traveler with time to watch their goings and comings during a few evenings will discover. As in southern China, the pan-basket in which rice is screened and prepared for cooking is made of bamboo splints, but they use clean water rather than any filth in which to wash it."

23: Franck--345 T-2 (1924) 1926 Laotians
116, 243, 343

"Little huts on stilts everywhere awaited the coming of laborers to the fields, lying fallow in grass now, but planted in July and harvested in November. There is no water for flooding at other times, because it does not rain enough, though with the industry and industry and ingenuity of the Chinese they could easily harness the rivers that run away toil-less to the distant sea. But there is no need to do so, because there is no such crowding and consequent hunger as in China and its slender little offspring, Annam."

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and prepared. This affliction is doubtless due to the Laotian peasants' prolonged stay in the hot and nauseating mud of the ricefields.

Cases of purulent ophthalmia make their appearance between December and March and, in addition to a special predisposition of the race to this disease, its cause must be attributed to the many air currents and drafts which find their way between the walls of houses during the season of great winds.

This affliction, which affects mainly children and adolescents, is aggravated by uncleanliness and by the use of already contaminated bandages. Even the most serious cases of ophthalmia disappear, often within a few days, when treated with boric acid solution or zinc sulphate applied by means of antiseptic cotton wool or gauze.

The skin disorders are leprosy, alopecia, frambesia, prurigo, a variety of watery skin disorders and types of pityriasis and stubborn sores caused by wounds by sharp weapons, tools or splinters.

At the beginning of 1900 Dr. Jamelme of the Saint-Louis Hospital went on a mission in Laos the purpose of which was to diagnose and identify the existing skin disorders as well as to study treatments which might be applied.

[115] Goiter is also quite widespread among the mountainfolk, especially among those who drink water which has flowed over calcareous rock or serpentine. One sees men, women and even childre afflicted with monstrous double and triple goiters, the volume of which often exceeds that of a man's head.

Syphilis is also prevalent in Laos. It was imported by Siamese soldiers and is widespread only in the regions where they stayed most. Sufficient proof of this fact is seen in its absence in the regions inhabited by the Khas.

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Ever since our settlement in Laos the health service has maintained a strict surveillance and its dispensaries have cared for sick persons of both sexes (1).

(1) There are three field infirmaries in Laos directed by Colonial physicians and located at Khong, Vien-Tiane and Luang-Prabang. Unfortunately, the reports sent by these physicians to the head of the health service have not been published.

149; Reinach--220 G-3 (no date) 1901 AM1 Indochina
Laotians AM8

137!

The trees also support incomparable wild orchids with strange flowers, and climbing or twining plants of every possible shape and color which are as graceful as they are delicate, which cross, intertwine and with their lianas form an inextricable jungle, a curtain of flowers, stems and foliage which moves at the whim of the winds and is so thick in certain spots that it casts an almost perpetual shadow (1).

(1) The exact nomenclature of these floral species is almost impossible to establish. We shall content ourselves with noting, among many others which are still unknown; the acacia, and principally the farnèse acacia; various kinds of lilacs; the double and single hibiscus, the African marigold and the zinnias, the lotus, the cockscomb, the marvel of Peru, the sunflower, several kinds of magnolias, syringa, camellias, etc.

824

Various plants used for food, medicine and dye also grow in the forests, such as yams, taros, ginger, cardamom, annatto, curcuma, catechu (sisièt), Campeachy wood, wild indigo, etc., as well as trees and lianas which produce resins, oil lac, black and red lacquer, damarine (huile de bois), benzoin, wax, gums and rubber.

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Rice and maize are cultivated on the plateaus, low hills, mountainsides and in the valleys, as well as on the alluvial deposits of the Mekong. These form the basis of the natives' food supply and are essential elements in the manufacture of alcohol.

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The banks of the watercourses, which are covered by inundations every year and constantly fertilized by alluvial deposits, are [305] used for the cultivation of cotton, tobacco, indigo, castor oil plants, batatas, peanuts, manioc and vegetables and fruits such as onions, garlic, tomatoes, squash, melons, fennel, mustard, edible convolvuluses, sensitive d'eau, etc. In the gardens which are cultivated near the banks one also finds sugar cane, coconut palms, sugar palms, betel palms, latania palms, the poivrier bétel, the arborescent mulberry, peppers, coriander, mint, the citronella and [Illustration here] purslane. Here also are a large variety of fruit trees; banana trees (more than twenty-four varieties), cinnamon trees, fig trees, orange trees, tangerine trees, grapefruit trees, lemon trees, lime trees, pineapple trees, pomegranate trees, guava trees, mango trees, papaw trees, ebony trees (Diospyros ebenum), mangosteen trees, jack trees, durian trees, custard-apple trees, avocado trees, litchi trees, sapodilla trees (red balata), fayolliers (légumineuses), silk-cotton trees

245

241 Lower Laos and 1.1 inhabitant in Upper Laos), the considerable expense
311 which the establishment of a registry would involve, and the slight interest attached to such a measure in a land where our advantage lies in exercising only an indirect administration, it is impossible for me to reply in any precise fashion.

"All that I can say is that the area of cultivable land is about 80,000 square kilometers, and that it is very unevenly distributed.
[312] The southern part of the possession does offer a certain number of vast plains which are well irrigated or can be irrigated and which are admirably suited to agriculture.

"The northern part, on the other hand, is almost exclusively made up of a series of juxtaposed mountain masses in a nearly unbroken line which leaves only an insignificant place for the rare valleys and plateaus satisfying the conditions required by agriculture.

"The area of cultivated land may be estimated arbitrarily at 30,000 square kilometers, distributed as follows:
Southern Laos, 20,000 square kilometers.
Northern Laos, 10,000 square kilometers.
} Giving about 15 inhabitants per cultivated square kilometer."

In the preceding chapter we gave a list of the plants which compose the flora of Laos. We shall supplement it here by studying those which are grown as regular crops.

243 RICE. Rice, being the basic food of the Laotians, occupies first place among the country's crops.

Two varieties of rice are grown in Laos, glutinous rice or "Nep" (in Annamite) which is called "Khao-Niaou" in Laotian, and dry rice or "Khao-Tiao" which is known in trade as Cochinchina white rice.

The first is more nourishing and contains a higher percentage of starchy matter. Because of its particular qualities, it is the type most widely cultivated for food and for the manufacture of alcohol.

Dry rice or "Khao-Tiao" is also cultivated, but in smaller quantities. It is primarily used for making pastry and for food by inhabitants of certain races which do not eat glutinous rice.

[554 262] Persons of a certain standing even go so far as to eat only "Khao-Tiao" out of ostentation.

Glutinous rice is grown in plains ricefields as well as in terraced ricefields on hillsides and in "Rais" or temporary clearings in the mountains.

Dry rice may be grown in the plains, but is generally cultivated in mountain rats, for the peoples who consume it are settled in the highlands. Indeed, the Khas are the ones who mainly practice its cultivation. The ratio of total dry rice production to that of glutinous rice is about one to four. 243

It is difficult to give any official figures, even approximate ones --for the reasons given above--regarding the total quantity of rice, whether the year be a good or bad one, which Laos produces. It differs, moreover, from one year to the next because of meteorological variations and also because of the damaging epizootic diseases which recur periodically, decimating the farming animals and forcing the inhabitants to reduce the area of their plantings. [231]

[355] One can, however, given the amount necessary for the subsistence of a family of five, deduce the approximate weight of rice which is indispensable for feeding any given group of people. 262 146

It is estimated that the average yearly consumption by a family of five is 28 piculs of paddy (1,700 kilograms), which yield about 17 piculs of threshed rice (1,026 kilograms). 243

Now the total population of Laos, which is estimated at 470,000, will normally contain 94,000 families of five, or groupings of five individuals of all ages and both sexes. On this basis it is easy to calculate that the amount of paddy needed to feed these 94,000 groups will be 2,632,000 piculs (159,800,000 kilograms) of paddy and 1,598,000 piculs (96,440,000 kilograms) of threshed rice.

In addition to this indispensable minimum merely for feeding the inhabitants, other quantities of rice are also necessary: 1) For fodder for certain animals and for making alcohol, pastry, etc., a consumption figure which we estimate at one-fifth of the above figure, or 526,400 piculs of paddy (31,794,560 kilograms) or 319,600 piculs of threshed rice (19,308,840 kilograms); 2) For seed and emergency reserves. These latter may be calculated at the rate of 5 piculs of paddy per house or per family of five, and require about 600,000 piculs of paddy (36,240,000 kilograms). 243 262 273

In recapitulation, it is clear that the amount of paddy which Laos ought to produce for food for its inhabitants, fodder for certain animals, the manufacture of alcohol, miscellaneous uses, seed and reserves is some 3,758,000 to 3,800,000 piculs or 226,983 to 229,520 tons, giving an average ratio of 1) 485 kilograms or 8 piculs of paddy per inhabitant; or 2) 2,425 kilograms or 40 piculs per family.

243 262 In reality, this is neither always nor everywhere the case. There are bad years when, because of a shortage of water, production in the ricefields falls by 30 or 40 percent, and the natives are then obliged to turn for their food to the roots, yams and taros which they find in the forest.

[311] [356] It is the northern part of Laos which mainly suffers from this sad state of things, as a result of its hydrological régime, the particular disposition of its farming land, and the fragmentation of the latter into relatively small plots which are remote from one another.

312 In southern Laos the vaster plains and a more complete natural irrigation which can easily be increased as the need arises make it possible not only to satisfy local needs but also to provide paddy and threshed rice for export. Thus in 1898 900 tons of paddy were exported to Cambodia and Cochinchina (1).

439

(1) These exports, which seem rather slight, will certainly increase provided that crops are good.

243 439 Here, by way of indication, are some current prices per hundred kilograms of paddy and decorticated rice:

Northern Laos	Paddy	4 francs 10 centimes to 9 francs
	Rice	8 francs 30 centimes to 10 francs 60 centimes
Southern Laos	Paddy	1 franc 65 centimes to 3 francs
	Rice	8 francs 30 centimes to 12 francs 50 centimes

243 In the figures given above as representing the amount of cereal grains needed to feed the population, we should include a certain quantity of maize. We do not have sufficient information to be able to show its importance with respect to the total production of cereals and consequently to say by how many tons the total figure for the paddy crop ought to be reduced in order for this difference to be applied to maize.

Nevertheless, if we take as a basis the total number of inhabitants who grow this crop, we may estimate that in northern Laos the ratio of maize production to that of paddy is about one to five. In southern Laos this crop is much less extensive.

149: Reinach--262 G-3 (no date) 1901 AM1 Indochina
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Rice is grown in two different ways in Laos: in inundated ricefields on plains or hills, and in rais or [357] temporary mountain clearings. Only one crop is harvested per year, from November to January, since the Laotians do not practice artificial irrigation and count only on the water supplied by rain.

Maize is always grown in rais or on the edge of terraced hillside ricefields. In southern Laos only the Khas have any in their fields. The Laotians produce maize only in their gardens, as a vegetable.

Glutinous or aquatic rice grows well only on low, hot, swampy land where the soil is heavy. Dry rice, on the other hand, thrives only on ordinary soil which is moist and slightly sandy, and on heights up to an altitude of 1,800 meters where it can endure temperatures which are relatively low for tropical regions (5° and even lower).

Plains ricefields. The land in plains ricefields generally consists of soil containing a high percentage of vegetable matter. It is composed of alluvia worked by earthworms and containing organic vegetable matter in decomposition. The clayish and sandy soil is deep enough to permit growth and nourishment of the plant roots. It generally rests either on rock, or on a compact sediment or on an alluvial strata which has a higher clay content and has not been penetrated by worms. This bottom layer prevents the ground water which is indispensable to the growth of the grain from escaping.

Terraced ricefields. In the ricefields which are terraced or arranged in steps, and which are situated on hillsides or the lower slopes of the mountains which enclose high valleys, the layer of vegetable matter is fairly thin. This is due to the fact that rocky particles removed from the peaks by running water have been deposited on natural terraces where they form a kind of alluvial cone. Man's handiwork has extended and leveled them, and arranged them in such a way that the alluvia will not be carried lower. Dikes or levees of earth and stones limit the successive terraces which cover the slopes, like the steps of a gigantic stairway. They hold back the vegetable soil, and at the same time their inner faces [358] constitute the walls of irrigation canals which circulate from one step to another from the top of the hills to the bottom, diverting into the furrows, through slits which may be opened at will, the waters of a brook or torrent which has been captured at a higher level.

Rais. Rais take their name from a Siamese unit of area measurement which is applied to ricefields and which represents a square forty meters on a side, or 1,600 square meters. They are

243 clearings made in the mountains in the midst of the wild forest. All the vegetation cut down is burned where it falls, and its ashes constitute a fertilizer added to the humus in the soil.

Rais can generally be seeded for two years only, sometimes three but never more. They are abandoned at the end of this period, for the roots of the fallen vegetation are no longer there to hold the soil in place and rainwater, which is no longer screened and partly absorbed by the foliage of the trees and plants, strikes the denuded soil with force and gradually wears it away. Running water thus carries off all the vegetable particles one by one to the valley bottoms, sometimes leaving nothing but bare rock.

243 Farming methods. 1) Plains ricefields.
312 The terrain is divided into more or less regular compartments which are nearly rectangular in shape and are 30, 40 or 60 meters on a side. They are separated from one another by earth dikes or levees which are .6 meter high and the same width at the base. Slits are pierced in the dikes to enable water to circulate and to permit the artificial swamps which each compartment or plains rai constitutes to be either inundated or drained. The canals which circulate through the ricefields are either diverted from a higher watercourse or else fed by various means which make it possible to raise water from a lower level.

243 Plowing is begun when the first rains have fallen and when the soil, which had acquired deep cracks under the action of the sun, has first soaked in water and then become sufficiently saturated.

This operation is carried out with the help of a rudimentary plow drawn by a buffalo and directed by a man. Furrows are thus [359] traced underwater in the semi-fluid, warm and nauseating mud of the ricefield. After this first operation the water is allowed to remain for a while, and then the ricefield is drained. It is harrowed and rolled, and water is again let in. Then the land is ready for transplanting the young rice plants.

The rice which is to supply plants for transplanting has been sowed in a chosen compartment which is sometimes [Illustration here] fertilized (lime, buffalo and ox manure). When the young shoots reach a height of 15 to 20 centimeters in the seed-garden they are uprooted and replanted in clusters of three or five plants each in the ricefield which has been prepared as above. Transplanting is done in squares or in a staggered arrangement, with the plants 30 to 40 centimeters apart.

In some parts of northern Laos there are even two successive transplantings two weeks apart. When they come out of the seed-garden

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the plants are replanted a few centimeters [360] apart in a second seed-garden for growth. This procedure increases the plant's productivity quite appreciably.

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Since the nature of the terrain and the richness of the soil vary from one point to another, it follows that the yield from the ricefields is not uniform. By reason of these conditions and the varying amount 312 of water which falls on the fields or is piped in, this yield varies from 40 to 90 parts for one part of seed, and from 15 to 25 piculs per hectare (1). The rice is harvested about four or five months after

[101]

(1) In Cochinchina the average yield is from 28 to 30 piculs, and in Tonkin 44 piculs. But one should not lose sight of the fact that Cochinchina and Tonkin are much better favored than Laos from the point of view of irrigation, and that the Annamites are past masters in the art of farming.

transplanting.

243

2) Terraced ricefields. The soil is worked in the same way in these ricefields, except that in some cases the land is turned over with a spade instead of plowed.

3) Mountain rais. In the year following the one when the land was cleared, the soil of the rais is cleaned and weeded. Then in June the rice is sowed, either broadcast or else by dropping a few grains at a time into holes made with a kind of bamboo dibble.

The rais are harvested in October and even in September in some localities. In general the yield from rais is from 90 to 120 parts for one part of seed and from 10 to 20 piculs per hectare.

Maize is sowed directly in straight furrows about March or April, and is harvested in July.

249

TOBACCO. Tobacco (Ia-Doute) is widely consumed in Laos, where everyone smokes. It is also an excellent commodity for trade and export. It is cultivated on a large scale on the banks and islands of the Mekong from Pak-Lay to a point below Pone-Pissay. Production [43-] from the tobacco fields in these regions not only supplies local needs, but also those of all of Upper Laos and part of Lower Laos and provides tobacco for export to Siam and Cochinchina.

[361] In addition to the foregoing, almost the whole population along the banks of the Mekong and the lower reaches of its tributaries also grows tobacco for its own use and for the inhabitants of the interior. The tobacco which is most prized for its high quality, however,

316 begun at judiciously chosen points [Illustration here] they can be accommodated to the existing means of communication and transport 313 if necessary. As for the sums needed to engage in a commercial, mining or forest enterprise, it is difficult to determine these in any 185 precise fashion for, depending on the region and the special conditions of the terrain, such matters may require more or less capital.

[518] For dealing in teak wood (1), for example, the sums needed

(1) A rigorous investigation made by a chief guardsman of the Laotian militia of the region of Xieng-Khong, on the left bank of the Mekong, has shown that the number of teak trees ready for cutting in the province of Muong-Sing is 4,975 in all, 2,000 of which are of exceptional size for the region, that is to say that their diameter varies between 0.3 and 0.6 meter. Counting the young shoots and young trees, the total number of teaks which we possess in Muong-Sing may be estimated at about 20,000.

Another group is situated on the right bank of the Mekong, in the vicinity of Pak-Lay and in the basin of the Nam-Poun. It includes from 10,000 to 12,000 teak trees ready for cutting, concessions for about half of which have been granted. (Bulletin économique de l'Indo-Chine, 1900.)

for purchase and transport would depend on the quantity which it was desired to export. As an average indication, the sum of 40,000 francs might be given for operations on 1,000 teak trees.

From the point of view of mineral resources, certain deposits require capital in the millions for their exploitation, while others might be worked profitably with sums varying between 250,000 to 500,000 francs.

433 In the way of industries which may be started at the present time, 185 we may cite only the establishment of rice distilleries in southern Laos and of a mechanical sawmill at Khone.

[273 243] A distillery could be set up without any great expense at the mouth of the Mekong and the Sedone, for example. Thanks to the price of glutinous rice which is five or six times less expensive in this region than at Pnom-Penh, the alcohol from such a distillery would find a certain market in Cambodia.

185 For several years now there has been talk of establishing a 313 mechanical sawmill on the island of Khone which would obtain its 439 motive power from the nearby waterfalls. Besides teak wood (2),

(2) Teak is generally regarded, although wrongly, as the wood

196
[touques].

The experts throw themselves on the stone, turning it over to 182
see if its underside has been wetted. According to the arrangement [187]
of the dry spots, [41] deductions are drawn on the topography of the 243
rice fields which will be flooded, or remain dry, and on the advantage of making rice fields either "high or low."

This sacrifice of the buffalo is found in the myth of Gavampati [189]
the strange monk held aloof by the Buddhist community because he took the attitude of being an enemy of the waters. His death allowed the arrival of the rains.

Khao Vassa (Feast of the Eighth Month). 196

This is the date of the beginning of the Buddhist Lent. During 192
the three months of rains, not being able to go from one place to another preaching, the Buddha and his community retired into the park of the Jetavana. Besides the season of rains, as it awakens life 183
everywhere, causes animals to swarm in great numbers. It is therefore impossible at this time of year to travel without violating, at each step, the precept which forbids the destruction of all existence, however infinitely small it may be. Thus, during this period, the bonzes may not leave the pagoda and are obliged to be present at the general confession.

Oldenberg describes this confession according to the Pali texts as follows:

"No monk may miss it. Only he who is stricken with mental alienation may be dispensed. . . . By the light of a torch, the monks take their places at the place of assembly on low stools which have been prepared for them. Neither laymen nor student bonzes [bonzillons] nor nuns may be present, for the rule of the Order, to be recited in the form of a formula of confession, is considered in principle as a secret appurtenance of the monks only. This formula of confession, the Patimokkgam, is recited aloud by the oldest member [doyen].

"Oh Reverend one, whoever has committed a sin, may he confess it. . . . After the third time that the question has been repeated, if a monk does not confess a sin which [42] he has committed and which he remembers, he is guilty of an intentional lie. Now an intentional lie, oh reverend one, is an obstacle to religious life. Such are the words of the Blessed One."

Then there follows a list of the sins which must be confessed. At the head of the list are the most serious ones:

the present time only the lion is kept, for apparently its role is no longer very well known. 527 825

[68]

THE HARVEST FESTIVAL

This takes place after the harvest, during the first and second months, and is held in the open countryside. Its purpose is to glorify "the soul of rice." 527 243

It is not until the threshing has been completed and the rice piled up in heaps that the master of the harvest consults his neighbors and chooses with them the day of celebration. Light shelters must then be built on his field around the threshing area to accommodate the guests. On the top of the pile of paddy a sort of pulpit is erected from which the bonzes will recite their prayers.

On the morning of the feast day, the master of the house slaughters [262] an ox from which is made the traditional lap, a dish consisting of raw meat and chopped up peppers mixed with various chopped up green vegetables the whole held together with a soup of pa dek. In the evening a court of love is held and the mo lam (professional singers) are also invited. At the end of this first night, the bonzes climb into the pulpit before daybreak to read the legend of Nang Kho Sop. 527 773

"In the olden days a grain of rice was as big as a gourd. It was cut down with an axe. Then Nang Kho Sop (the soul of rice) became angry at this barbarous treatment and flew away. Since then this feast has been celebrated so that the soul will return."

The reading closes as day breaks, and offerings are made to the bonzes. At the close of the prayer, each one of the faithful, before rising, sprinkles a few drops of water on the ground so that Nang Thorani may bear witness to their alms and so that the goddess may not forget to count it among the merits he has acquired for his future lives.

[69] The owner takes a basket filled with boiled chicken, alcohol, sweet potatoes, and all kinds of tuberous roots. He goes by himself into his rice field and walks over it in every direction, at the same time calling the soul of rice to thank it for having made his fields bear fruit and to beg it to continue being equally generous to him in future years. He offers it all the food in the basket saying: Soul of Rice, here are tuberous roots for thee, here are buds of cabbage palm, and good alcohol made from thy grain. Soul of Rice, descend on us and preside over the feast I am giving in thy honor! 243 527

527 He then places his basket at the base of the pile of paddy and
243 the me-tao come and welcome the rice whose soul the owner of the rice is supposed to have brought back.

The master of the house then brings a straw mannequin personifying rice. Immediately the old women make a bassi before it, and tie white cotton threads to its gilded wrists. They then congratulate the rice on its return and beg it never to leave the granary again.

787 An old man, known for his powers of divination, takes the boiled
527 chicken from the basket, examines minutely its beak and claws, and
243 from signs he discovers in them, reads the fate of the coming harvest. When the prophecy is completed, he slides the entrails of the animal into the stomach of the little straw man as well as all the food from the basket.

527 The Rice figure thus adorned and restored is raised to the top of
243 the pile of paddy whence it will preside over the remainder of the feast.

Before the end of the festival, the wagons are brought out. When they are loaded with the Rice figure enthroned on the first wagon, the paddy is brought into the granaries. When the final load is under shelter, the owner places on its summit the mannequin which, still personifying the soul of Rice [70] will watch over the granary, keep away fire and lightning, and "see that the pile will never diminish or become level with the floor, however many baskets are filled from it."

The master of the harvest is careful to remove a sufficient supply of paddy to last a few weeks, then closes the granary and decorates the door with branches of khoun (to bring luck) and of som seune (gaiety). These will keep luck and gaiety in the house. Hereafter, under no pretext whatever, may the door of the granary be opened before the third day of the third month," because then "the frog has no mouth and the dragon no anus," and consequently no voracious animal will dare come and devour the harvest.

The Feast of the Khao Chi

527 According to S. Karpelès this ceremony takes place once a year
112 in every quarter of Luang Prabang. It consists of going to the neighborhood of the capital with the bonzes of the pagoda of the designated quarter. A large procession leaves the town, headed for a plateau at the entrance to the forest. While the women are busy with the cooking, the men settle the venerable old men on rugs. The young men and novices cut down branches, clean off the bark leaving a plume of